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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/671,971	09/25/2003	David W. Gish	ITL.1574US (P17016)	8875

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EXAMINER	
ZAMAN, FAISAL M	

ART UNIT	PAPER NUMBER
2111	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/671,971	GISH ET AL.	
	Examiner	Art Unit	
	Faisal Zaman	2111	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 March 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,4-9,11,12,15,16 and 18-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4-9,11,12,15,16 and 18-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *23 February 2007* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. **Claims 1, 4, 5, 15, 16, 21, and 22** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claims 1, 15, 21, and 22 have been amended to include the limitation "increasing [or decreasing] the accumulator value by a variable amount". The examiner is unable to find where in the originally filed specification this limitation is supported, since the term "variable" is defined as "a quantity that can assume *any* of a set of values". To the contrary, it appears that the accumulator value is restricted to a predetermined value, see Page 5 line 23 – Page 6 line 2 of the originally filed specification ("the algorithm will set n accumulator values for n bidders to a *predetermined value within a range of values*"), which is the same method used in the disclosure of Kato, as described below. If Applicant disagrees, Applicant is respectfully requested to show where in the originally filed specification this limitation is supported.

All claims not specifically addressed are rejected due to a dependency.

Appropriate corrections are therefore required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. **Claims 1, 4, 6, 7, 9, 12, 15, 16, 21, 22, and 24** are rejected under 35 U.S.C. 102(e) as being anticipated by Kato (U.S. Patent No. 6,961,793).

Regarding Claims 1 and 15, Kato discloses a method for arbitrating a resource comprising:

Setting n weight values for n bidders (Column 5, lines 5-7; Column 6, lines 13-16; where the "basic priority data" is equivalent to the n weight values and "plurality of bus masters" is equivalent to the n bidders);

Setting n accumulator values for the n bidders, wherein the n accumulator values are based at least in part on the n weight values (Column 5, lines 7-13; Column 6, lines 16-20; where the "arbitration priority data" for the plurality of bus masters is equivalent to the "n accumulator values for n bidders" since the arbitration priority data is an accumulation of the basic priority data and request indication data of the various bus masters);

Granting one of the n bidders to receive access to the resource based at least in part on the accumulator value (Column 5, lines 13-23; Column 6, lines 20-25), and then decrementing the selected bidder's accumulator value (Column 5 line 66 – Column 6 line 5; also Column 10 line 57 – Column 12 line 6, or Column 12 lines 7-60); and

Increasing the accumulator value by a variable amount based on the accumulator value for the n-1 losing bidders, wherein a probability of the n-1 losing bidders for accessing the resource is increased based on a respective standing of the accumulator value within a range of values (e.g. 0 to 7) for the accumulator for the n-1 losing bidders (Column 12, lines 13-15; ie. by increasing the priority for each of the losing bidders/masters in each cycle, the probability of that master having access granted in the next cycle increases).

Regarding Claim 4, Kato discloses wherein the accumulator values (ie. the arbitration priority data) are initially set to a midpoint of a range (Column 5, lines 5-13).

Regarding Claim 6, Kato discloses an apparatus to arbitrate access to a resource comprising:

A plurality of n registers to store n weight values (Figure 4, item 50, Column 7, lines 36-44; ie. where PRIBASEi is equivalent to the n weight values);

A plurality of n accumulators (Figure 4, items $60_1 – 60_n$) to each receive a request (Figure 4, item REQ1 – REQn) to the resource and to accumulate and store n accumulator values, wherein the n accumulator values are based at least in part on the

n weight values (Column 5, lines 7-13; Column 6, lines 16-20; where the "arbitration priority data" for the plurality of bus masters is equivalent to the "n accumulator values for n bidders" since the arbitration priority data is an accumulation of the basic priority data and request indication data of the various bus masters);

A comparator, coupled to the plurality of accumulators, to grant access to one of the requests based at least in part on the past history of granted requests and the n accumulator values (Figure 4, item 62, Column 8, lines 39-46).

Regarding Claims 7, 21, and 22, Kato discloses wherein the comparator is to decrement the accumulator value of the accumulator that was granted access to their request in an amount corresponding to the n weight value associated with the accumulator (Column 5 line 66 – Column 6 line 5; also Column 10 line 57 – Column 12 line 6, or Column 12 lines 7-60).

Regarding Claims 9 and 16, Kato discloses wherein the weight value (ie. the basic priority data) is initially set according to a priority of the request (ie. from the bus master) (Column 8, lines 50-53).

Regarding Claim 12, Kato discloses wherein the resource may be an interconnect bus (Column 7, lines 21-23), memory unit, or output buffer.

Regarding Claim 24, Kato discloses wherein each of the plurality of n registers (Figure 4, item 50) is coupled to a corresponding one of the plurality of n accumulators (Figure 4, items $60_1 - 60_n$).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. **Claims 5 and 8** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kato.

Regarding Claims 5 and 8, Kato does not expressly disclose wherein the range of values is based on a quartile, the accumulator value is incremented by one if the accumulator value is within 76-99% of the range, the accumulator value is incremented by two if the accumulator value is within 51-75% of the range, the accumulator value is incremented by three if the accumulator value is within 26-50% of the range, the accumulator value is incremented by four if the accumulator value is within 0-25% of the range.

However, Kato teaches wherein the accumulator values (ie. the arbitration priority data) of each of the bidders (ie. the bus masters) is increased if the accumulator values is not at the highest value at the time of the arbitration, based on an "oldest bus acquiring master priority system" (see Column 12, lines 7-60).

Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made that the use of a quartile priority system as disclosed in Claim 5 would have been advantageous for use in the arbitration system of Kato, for the purpose of having a more efficient and accurate bus prioritization system.

7. **Claim 11** is rejected under 35 U.S.C. 103(a) as being unpatentable over Kato as applied to Claim 8 above and Applicant's Admitted Prior Art (hereinafter "AAPA").

Kato teaches the apparatus of Claim 8 as described above.

Regarding Claim 11, Kato does not expressly disclose wherein a bidder that is to provide the request is either one of a modem, keyboard, video controller, serial port, or PCMCIA card, SONET interface, Ethernet Interface, content processor, encryption device, or compression device.

In the same field of endeavor (e.g. bus access arbitrating methods), AAPA teaches wherein a bidder that is to provide a request is either one of a modem, keyboard, video controller, serial port, or PCMCIA card, SONET interface, Ethernet Interface, content processor, encryption device, or compression device (Page 2, paragraph 0002).

Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have combined Kato's teachings of bus access arbitrating methods with the teachings of AAPA, for the purpose of providing a bus arbiter in which it is possible to efficiently arbitrate bus access requests with a simple structure (see Kato, Column 4, lines 64-67).

8. **Claims 18-20, 23, and 25** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kato and Dao et al. ("Dao") (U.S. Patent No. 6,915,369).

Regarding Claim 18, Kato teaches a system comprising:

A processor (Kato, Column 7, lines 24-26);

A plurality of bidders to access a resource (Kato, Figure 4, items $20_1 - 20_n$);

An arbitration logic with a plurality of n registers to store n weight values (Kato, Figure 4, item 50, Column 7, lines 36-44; ie. where PRIBASEi is equivalent to the n weight values);

A plurality of n accumulators to accumulate and store n accumulator values (Kato, Figure 4, items $60_1 - 60_n$) and to each receive a request (Kato, Figure 4, item REQ1 – REQn) from the plurality of bidders, wherein the n accumulator values are based at least in part on the n weight values (Kato, Column 5, lines 7-13; Column 6, lines 16-20; where the "arbitration priority data" for the plurality of bus masters is equivalent to the "n accumulator values for n bidders" since the arbitration priority data is an accumulation of the basic priority data and request indication data of the various bus masters);

A comparator, coupled to the plurality of n accumulators, to grant access to one of the requests based at least in part on the past history of granted requests and the n accumulator values (Kato, Figure 4, item 62, Column 8, lines 39-46).

Kato does not expressly teach a dynamic random access memory, coupled to the processor; and

Wherein the n weight values and n accumulator values are to be configured by a user.

In the same field of endeavor (e.g. arbitration of a resource between multiple requestors), Dao teaches a dynamic random access memory (Dao, Figure 1, item 106), coupled to a processor (Dao, Figure 1, item 104); and

Wherein requestor priority values are to be configured by a user (Dao, Column 6, lines 21-38).

Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have combined Dao's teachings of arbitration of a resource between multiple requestors with the teachings of Kato, for the purpose of increasing the flexibility of the system by allowing the user to adjust the priorities of the bus masters according to the user's needs.

Regarding Claim 19, Kato discloses wherein the arbitration logic is to decrement the accumulator value of the accumulator that was granted access to their request in an amount corresponding to the n weight value of the corresponding bidder (Column 5 line 66 – Column 6 line 5; also Column 10 line 57 – Column 12 line 6, or Column 12 lines 7-60).

Regarding Claim 20, Kato does not expressly disclose wherein the arbitration logic is to perform a quartile analysis on each of the losing bidders such that the accumulator value associated with each of the losing bidders is incremented by one if

the accumulator value is within 76-99% of a range for the corresponding accumulator, the accumulator value is incremented by two if the accumulator value is within 51-75% of the range, the accumulator value is incremented by three if the accumulator value is within 26-50% of the range, the accumulator value is incremented by four if the accumulator value is within 0-25% of the range.

However, Kato teaches wherein the accumulator values (ie. the arbitration priority data) of each of the bidders (ie. the bus masters) is increased if the accumulator values is not at the highest value at the time of the arbitration, based on an "oldest bus acquiring master priority system" (see Column 12, lines 7-60).

Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made that the use of a quartile priority system as disclosed in Claim 20 would have been advantageous for use in the arbitration system of Kato, for the purpose of having a more efficient and accurate bus prioritization system.

Regarding Claims 23 and 25, Dao teaches enabling a user to set the priority values of the requestors (Dao, Column 6, lines 21-38).

The motivation that was used in the combination of Claim 18, super, applies equally as well to Claim 23.

Response to Arguments

9. Applicant's arguments filed 2/23/2007 with regards to Claims 1, 6, and 15 have been fully considered but they are not persuasive.

Regarding Claims 1 and 15, Applicant argues that "Kato nowhere teaches, at least, increasing an accumulator value for losing bidders by a variable amount based on the accumulator value", and further "Kato does not teach accumulator values whatsoever." The examiner respectfully disagrees. First, as described in the 35 USC 112 first paragraph rejection above, the increasing/decreasing of the accumulator values by a variable amount was not disclosed in the originally filed specification. Rather, page 5 line 23 – page 6 line 2 of the originally filed specification states "the algorithm will set n accumulator values for n bidders to a *predetermined value within a range of values*", which is the same method used in the disclosure of Kato. Second, with regards to the claimed "accumulator values", Kato does in fact teach this limitation, see Column 6, lines 16-20. The examiner interprets the "arbitration priority data" as the so-called "accumulator values", since the arbitration priority data of Kato is an accumulation of the "basic priority data" of each of the masters with the "request indication data" of each of the masters. As can be seen in Figure 1 and related text of the instant application, this is the same as the accumulator values recited in the claims (Request N 102 combined with Weight N 104).

Therefore, claim 1 stands as previously rejected.

Regarding Claim 6, Applicant argues that "Kato nowhere teaches accumulators that are to accumulate and store accumulator values." The examiner respectfully

disagrees. The examiner equates arbitration priority generating sections 60_n of Figures 4 and 5 to the claimed accumulators, since they receive and combine the basic priority data along with the request indication data from each bus master before sending it to arbitration priority comparing section 62. Accordingly, arbitration priority generating section 60_n must store the basic priority data and request indication data in order to combine them and then generate the arbitration priority data.

Therefore, claim 6 stands as previously rejected.

10. Applicant's arguments with respect to claim 8 have been considered but are moot in view of the new ground(s) of rejection. Kato does not appear to teach configurability of the n weight values and n accumulator values by a user. However, Dao et al. (U.S. Patent No. 6,915,369) teaches this limitation.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Faisal Zaman whose telephone number is 571-272-6495. The examiner can normally be reached on Monday thru Friday, 8 am - 5:30 pm, alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Rinehart can be reached on 571-272-3632. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

FMZ

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